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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,030	07/17/2003	Mamoru Soga	5077-000064/CPA	2257

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HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER	
SHOSHO, CALLIE E	

ART UNIT	PAPER NUMBER
1714	

DATE MAILED: 05/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/622,030	SOGA ET AL.	
	Examiner	Art Unit	
	Callie E. Shosho	1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/929,728.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 7/17/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 9 is rejected under 35 U.S.C. 102(b) as being anticipated by EP 556649.

EP 556649 discloses ink jet ink comprising water, colorant, surfactant, and ABC block polymer. The ink possesses surface tension of 20-70 dynes/cm. Given that the ABC block polymer comprises A block which is hydrophilic polymer, B block which is hydrophobic polymer, and C block which is hydrophilic polymer, it is clear that the hydrophilic segment is located outside the hydrophobic segment (abstract, page 2, lines 3-5 and 49-54, page 3, lines 14-16, and page 6, lines 22-23 and 39-45).

In light of the above, it is clear that EP 556649 anticipates the present claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Courian et al. (U.S. 5,874,974) in view of Lin et al. (U.S. 5,531,818) and Coca et al. (U.S. 6,336,966).

Courian et al. disclose ink jet ink comprising pigment, humectant, butyl alcohol, which is well known, as found in Lin et al. (col.11, lines 48-59), as a penetrant, and star dispersant comprising hydrophobic segment that links to the pigment and hydrophilic segment. The ink possesses surface tension of 15-72 dyne/cm and viscosity of 1-10 cP. There is also disclosed ink

jet printer comprising ink which is contained in ink cartridge wherein the printer is used to form printed image by ejecting the ink onto substrate (col.2, lines 33-36, col.8, lines 55-65, col.27, lines 1-9 and 19-26, col.30, lines 8-10, col.32, lines 60-63, col.34, lines 49 and 66, and col.35, lines 8-36).

The difference between Courian et al. and the present claimed invention is the requirement in the claims of specific star polymer.

Coca et al. disclose the use of dispersant, suitable for use in inks, which is star block copolymer that possesses arms comprising both hydrophobic and hydrophilic chain segments wherein the hydrophilic portion is located in the outer portion of the arm. The motivation for using such dispersant is to produce stable dispersion wherein the dispersant is effective in preventing the pigments from re-agglomerating or settling out of the dispersion (col.1, lines 8-14 and 41-45, col.2, lines 2-8, col.3, lines 44-65, and col.19, line 4).

In light of the motivation for using star block copolymer dispersant disclosed by Coca et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such star block copolymer as the star dispersant in the ink of Courian et al. in order to produce a stable ink, and thereby arrive at the claimed invention.

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spinelli (U.S. 5,772,741) in view of Coca et al. (U.S. 6,336,966) and Hosmer (U.S. 6,436,178).

Spinelli discloses ink jet ink comprising water, pigment, dispersant, and oil-soluble dye. The ink has surface tension of 30-70 dyne/cm and viscosity of 1-10 cP. There is also disclosed an ink jet printer which comprises the above ink and ejects ink onto substrate in order to form

image. Such printer would intrinsically possess ink cartridge to store the ink (col.3, lines 12 and 59, col.4, lines 58-65, and col.5, lines 36-42).

The difference between Spinelli and the present claimed invention is the requirement in the claims of (a) amphiphilic star block copolymer and (b) humectant and penetrant.

Spinelli discloses the use of block copolymer dispersant, however, there is no disclosure of amphiphilic star block copolymer as presently claimed.

Coca et al. disclose the use of dispersant, suitable for use in inks, which is star block copolymer that possesses arms comprising both hydrophobic and hydrophilic chain segments wherein the hydrophilic portion is located in the outer portion of the arm. The motivation for using such dispersant is to produce stable dispersion wherein the dispersant is effective in preventing the pigments from re-agglomerating or settling out of the dispersion (col.1, lines 8-14 and 41-45, col.2, lines 2-8, col.3, lines 44-65, and col.19, line 4).

With respect to difference (b), Hosmer, which is drawn to ink jet inks, disclose the use of penetrant in order to allow the ink to penetrate the surface of the paper and increase the rate of drying of the ink (col.3, lines 59-64) and humectant in order to reduce the rate of evaporation of water in the ink to minimize clogging (col.3, lines 10-15).

In light of the motivation for using star block copolymer disclosed by Coca et al. as described above and for using penetrant and humectant disclosed by Hosmer as described above, it therefore would have been obvious to one of ordinary skill in the art to use such star block copolymer as the dispersant in the ink of Spinelli in order to produce a stable ink, and to use penetrant and humectant in the ink of Spinelli in order to produce ink with increased drying rate which does not clog the printer nozzles, and thereby arrive at the claimed invention.

7. Claims 1-4 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1008634.

EP 1008634 discloses aqueous ink jet ink comprising humectant, penetrant, colorant, and amphiphilic star block copolymer which comprises arms obtained from both hydrophilic and hydrophobic monomers. The ink possesses surface tension of 20-70 dyne/cm and viscosity of 1-10 cP. There is also disclosed an ink jet printer which comprises the above ink and ejects ink onto substrate in order to form image. Such printer would intrinsically possess ink cartridge to store the ink (col.2, lines 5-6 and 34-37 col.3, line 9, col.3, line 52-col.4, line 1, and col.4, lines 8-12, 23-24, 31, and 36-45).

The difference between EP 1008634 and the present claimed invention is the requirement in the claims that the star block copolymer possesses outer hydrophilic portion.

Although there is no explicit disclosure that the star block copolymer possesses outer hydrophilic portion, given that EP 1008634 discloses that the functional groups of the hydrophilic portion of the star block copolymer are used to solubilize or disperse the star block copolymer, it therefore would have been obvious to one of ordinary skill in the art to include the functional groups on the outer portion of the star block copolymer in order to control the solubility of the star polymer, and thereby arrive at the claimed invention.

8. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spinelli (U.S. 5,772,741) in view of Hosmer (U.S. 6,436,178) and Petersen et al. (U.S. 6,201,099).

Spinelli discloses ink jet ink comprising water, pigment, dispersant, and oil-soluble dye. The ink has surface tension of 30-70 dyne/cm and viscosity of 1-10 cP. There is also disclosed an

ink jet printer which comprises the above ink and ejects ink onto substrate in order to form image. Such printer would intrinsically possess ink cartridge to store the ink (col.3, lines 12 and 59, col.4, lines 58-65, and col.5, lines 36-42).

The difference between Spinelli and the present claimed invention is the requirement in the claims of (a) amphiphilic heteroarm star copolymer and (b) humectant and penetrant.

With respect to difference (a), Spinelli discloses the addition of acrylic or non-acrylic polymers to improve various properties of the ink composition.

Petersen et al. disclose the use of heteroarm star polymer wherein the motivation for using such polymer is that it possesses narrow molecular weight distribution and exhibits low viscosity at low molecular weight due to its compact structure and high viscosity at high molecular weight due to its extensive entanglement (col.1, lines 6-18 and 39-44, col.2, lines 9-12, and col.4, lines 36-39).

With respect to difference (b), Hosmer, which is drawn to ink jet inks, discloses the use of penetrant in order to allow the ink to penetrate the surface of the paper and increase the rate of drying of the ink (col.3, lines 59-64) and humectant in order to reduce the rate of evaporation of water in the ink to minimize clogging (col.3, lines 10-15).

In light of the motivation for using heteroarm star polymer disclosed by Petersen et al. as described above and for using penetrant and humectant disclosed by Hosmer as described above, it therefore would have been obvious to one of ordinary skill in the art to use such heteroarm star polymer in the ink of Spinelli in order to produce ink with improved mechanical properties, film strength, block resistance, and abrasion resistance, or alternatively, to produce ink with suitable viscosity for printing, and to use penetrant and humectant in the ink of Spinelli in order to

produce ink with increased drying rate which does not clog the printer nozzles, and thereby arrive at the claimed invention.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Schoenberg et al. (U.S. 6,150,468) disclose heteroarm star polymer used as an emulsion stabilizer in emulsion polymerization.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
4/29/05